

## Lesson 4 Speed Notes and examples.notebook

### Velocity/SPEED

Speed (v) = is the rate at which an object changes it's position.

Velocity = is speed with a direction.

Ex. Bill travelled north at 90 km/hr

Units for speed/velocity.

meters/second (m/s) - how many meters were covered in 1 second

kilometers/hour (km/h) - how many km were covered in 1 hour

miles per hour mph

Distance (d) = how much ground an object covers.

Ex: millimeter (mm)

centimeter (cm)

meter (m)

kilometer (km)

miles (mi)  
feet (ft) - 15'  
inches (in) - 6"

Time (t) = how long an object is in motion for.

Ex: second (s)

minute (min)

hour (h) - hr

year (a) ← annum

- 3 different types of speed:

1) Average Speed

2) Instantaneous Speed

3) Constant Speed

### Average Speed:

Average Speed = the total distance covered divided by the total time for a trip.

- Average because when an object moves it often does not stay at the same speed.

- Example: On your way to school, the bus may have mostly gone 50 km/h but may have had to slow down, or speed up. Overall however, we say the average speed was 50km/hr.

### Instantaneous & Constant Speed

Instantaneous Speed = the speed an object is traveling at a particular moment. It is not affected by a previous speed. (when you look at the speedometer on your car)

Constant Speed = when the speed remains the same over a prolonged period of time.

#### Example:

A vehicle traveling a long distance that puts cruise control on at 110 km/h while driving on the highway.

Sci. Notation

ex 0.00000218

$$2.18 \times 10^{-6} \checkmark$$

2 S.D.  $\rightarrow$   $2.2 \times 10^{-6}$

ex 74740000000

$$7.474 \times 10^{10}$$

7.5

ex write with 3 sign. digits

ex 0.000728539

$$7.28539 \times 10^{-4}$$

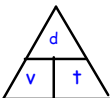
$$7.29 \times 10^{-4}$$

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$$v = \frac{d}{t} \quad \text{divide}$$

$$t = \frac{d}{v}$$

$$d = v \cdot t$$

$$v \cdot t$$


### SPEED EXAMPLES

#### Example #1:

A bullet fired from a rifle travels with a velocity of 500m/s. How long will the bullet take to travel between the rifle and a target 100m away?

d = 100m  
v = 500m/s  
t = ?

$$t = \frac{d}{v}$$

$$t = \frac{100\text{m}}{500\text{m/s}} = 0.2\text{ s}$$

#### Example #2:

The cruise control of a car is set at 100km/h. What is the distance traveled by the car in 2.5h?

d = ?  
v = 100km/h  
t = 2.5 hours

$$d = v \cdot t$$

$$d = 100\text{ km/h} \times 2.5\text{ hrs}$$

$$= 250\text{ km}$$

#### Example #3:

How long did it take a plane to travel 4200 km, traveling at 700 km/hr?

d = 4200 km  
v = 700 km/hr  
t = ?

$$t = \frac{d}{v}$$

$$= \frac{4200\text{ km}}{700\text{ km/hr}}$$

$$= 6\text{ hr}$$

#### Example #4

Traveling at a speed of 85 km/hr, how long does it take for a train to travel from Moncton to Halifax, a distance of 275 km?

d = 275 km  
v = 85 km/hr  
t = ?

$$t = \frac{d}{v}$$

$$t = \frac{275\text{ km}}{85\text{ km/hr}}$$

$$= 3.24\text{ hr}$$

$$= 3\text{ hr } 14\text{ min } 24\text{ sec}$$

3hr  
24mins.

$$8.45\text{ hrs} \rightarrow 27\text{ min}$$

$$.45 \times 60 = 27$$

$$27$$

$$.25\text{ hr} = 15\text{ min}$$

$$.5\text{ hr} = 30\text{ min}$$

$$.75\text{ hr} = 45\text{ min}$$